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KNOWLEDGE AND SPEECH REACTION

A NEW conception that is thorough-going always simplifies. In fact it usually originates when a prevailing point of view has got overloaded, cumbrous and involved. The notion of behavior is already having a simplifying and reducing effect upon epistemology and in my opinion is only beginning its career. But a new point of view also tends to oversimplify, to neglect, ignore and thereby in effect to deny. It is one thing, for example, to deny qualities, meanings, feelings, consciousness, *etc.*, as they have been defined by prior theories, especially by modern psychology with its helplessly subjective and private metaphysics. It is another thing to deny the facts which common sense and common speech independently of any theory call by these names. Personally, I believe that the identification of knowing and thinking with speech is wholly in the right direction. But, with one marked exception, I have not seen any analysis of speech which appears adequate or which does not lay itself open to the charge of omitting and virtually denying obvious facts.[1]

1. When it is asserted that speech as thought is a reaction, the question at once arises: What is its stimulus? The easy and simple reply is wrong. We are likely to say that speech is a reaction to a thing sensibly present, that, for example, I say "this is a knife" because a knife is sensibly present as a stimulus to speech. The behaviorist, of all persons, can not afford to give this account of the stimulus to speech. For if he does, he subjects himself to a final retort. The sensible presence of the knife is, then, already a case of knowledge, and speech instead of constituting knowledge merely voices, utters or reduplicates a knowledge already there in full existence. If the stimulus is not a thing sensibly present, neither is it merely some prior complete act or piece of behavior which causes contractions in the vocal organs. The utterances of a talking-machine

[1] The exception is the remarkably clear and comprehensive paper by Mead, in this JOURNAL, Vol. XIX, No. 6, on "A Behavioristic Account of the Significant Symbol."

are induced by an internal mechanism but they are not speech or knowledge; neither is a hiccough or groan or sigh, although it is caused in the vocal musculature by prior organic conditions.

There is a difference between the concept of stimulus-reaction and that of cause-effect. The former includes, of course, the latter, but it adds something. It has, in addition, the property of an adaptation, or maladaptation, which is effected. But adaptation alone is not enough to differentiate stimulus and response in the case of speech. A sigh may relieve suffering and in so far be adaptive. Seeing as an act may be part of the stimulus to saying "that is a knife," but it can not be the entire stimulus. For seeing as a complete stimulus gives rise to the response of reaching and taking or withdrawing, not of speech. What has to be accounted for is the postponement of the complete overt reaction, and its conversion into an intermediate vocal reaction. There must be some break in the seeing-reaching sequence, some obstacle to its occurrence, to induce a diversion from the hand to the voice. There must be a defective or hesitant connection between seeing and handling which is somehow made good and whole by speech. Hence the stimulus to speech can not be identified, *per simpliciter*, with its object. The latter is its consequence, not its antecedent.

2. Before fully developing the implications of this point we must turn to another phase of speech reaction. Not every speech reaction, even when genuine and not a mere vocalization, is a cognitive statement even by implication. Story-telling need not purport to state "facts" or "truths"; its interest may be increased by *vraisemblance*, but this trait serves a dramatic or imaginative end, not an intellectual one. A reader of Shakespeare may become a student of the sources upon which Shakespeare drew, and make speech reactions to this study. Then the reaction is cognitive. But he need not do so; he may be content to confine his speech reaction to a dramatic production. Again the reader may become interested in whether Shakespeare meant to represent Hamlet as mad; then his reaction is a judgment. But he may be satisfied merely to use speech as a means of re-creating a Hamlet either sane or mad; as a mode of story-telling or drama it makes no difference. There is no outside criterion till we go outside of mere story-telling. The play's the thing and it has no object of knowledge.

These remarks are intended to call attention to the need of discovering some differential trait of those speech reactions which do constitute knowledge. A story or play is there, and the re-enacting of it in a speech mode is purely additive. It makes another piece of behavior, but this new mode of behavior does not react back into

the play or story or its conditions. It is complete on its own account. A play of Shakespeare may mean a hundred different things to a hundred different audiences or a hundred different persons in the same audience, and the diversity of the hundred speech reactions evoked is no matter. The speech reactions need have no connection with what Shakespeare himself meant in his reaction, beyond being caused by the latter. But a judgment or thought about what Shakespeare himself meant does not have any such self-sufficing independence. It has to link up with something outside itself. It has to be a reaction not merely to the play as a provocative cause, but has to be a response which somehow fits into or answers to the play as stimulus. Our problem is to name that distinctive feature of a speech reaction which confers upon it the quality of response, reply, answer; of supplying something lacking without it.

We thus return to our prior analysis. The statement "this is a knife" is cognitive because it is more than a mere evocation of a prior piece of behavior. It serves to supplement or complete a behavior which is incomplete or broken without it. As response it is reaction in another sense than when we say in physics: action and reaction are equal and in opposite direction. Some physical reactions are quite independent of that action to which they are reactions except in a casual sense. But a response in statement is intimately connected with that to which it answers. It is not merely to it or away from it, but is back *into* it: that is, it continues, develops, directs something defective without it. Without speech reaction the action which causes it is blind trial or error; with it, or rather through it, the evoking action becomes purposive, that is, continuous, cumulative. To be more specific the response "this is a knife" is produced by reactions of seeing and incipient reactions of reaching, touching, handling, which are up to the point of speech reaction fumbling, choked and conflicting. Speech reaction unifies them into the attitude of unhesitant readiness to seize and cut. It integrates or coordinates behavior tendencies which without it are uncertain and more or less antagonistic. This trait is the differentia of judgment from speech reaction in the form of story telling and vicarious dramatic reproduction. Unless we acknowledge and emphasize this trait, the behavioristic theory falls an easy victim to the contention that language merely echoes or puts into verbal form an apprehension that is complete without it. The dilemma is unescapable. Either the speech reaction does something to what calls it out, modifying it and giving it a behavior characteristic which it otherwise does not have, or it is mere utterance of what already exists apart from it.

This fact throws light upon the oversimplification referred to at the outset. It is easy to overlook the modifying, re-directive and

integrative function of speech as a response. Then only one side of it is recognized, that of its being *caused* by a prior action. The result is an identification of stimulus and object of knowledge which not merely goes contrary to facts but which undermines the behavioristic statement. For since the stimulus as cause is there when the reaction takes place, the object must also be there, if stimulus and object are simply identified. Then, cognitively speaking, speech is a futile echoing, however useful it may be as a practical device for fixing attention or supplying a convenient memorandum for recollection.

Mr. Mursell, in his recent interesting article,[2] seems to me to illustrate the oversimplification in question and also its consequences. Speaking of perceptual judgments—speech reactions which state perceptions—he says they are "those judgments where the stimulus of the speech reaction is that to which the judgment has reference. I see a colored patch and respond by saying 'that is red.' I see my desk light burning and the muscles of my vocal organs are innervated to make the assertion 'the light is burning.'" So far the account is inconclusive with respect to our problem. No one would deny that speech reaction has reference to its stimulus or that an act of seeing is at least part of its stimulus. But the passage continues as follows: "In such cases the relation between the judgment and *its object* seems sufficiently clear. The object is the *cause* of the judgment, the causal nexus taking an intricate path through the nervous ganglia." (Italics mine.) Here the nature of the reference is unambiguously stated. Stimulus is cause, and as cause it is also the object of judgment.

If the stimulus is not simply a tendency to see, that is, an innervation of the optical apparatus, but is a seeing of "desk-light-burning," the non-behaviorist can adequately retort that seeing the light and the desk and their respective positions is already a case of knowing or judgment, so that speech is merely an addition, supernumerary for judgment though doubtless of practical and social utility. The case stands otherwise if the stimulus is an obstructed or incomplete act of vision, and speech serves to release, to direct and clinch it. In the latter case, the patch would *not* be known as red, say, or the light as the light of a lamp on the desk until the speech reaction definitely determined a stimulus. There is nothing paradoxical in this conception. We constantly react to light by using it, without knowing or naming it—without an explicit distinction and identification, and we very well know in dealing with novelties how names clear up and fix otherwise confusing and confused situations. Be-

[2] This JOURNAL, Vol. XIX, p. 187, "Truth as Correspondence."

havioristically, above all, we must conceive that speech response is not something final and isolated, but that it operates in turn as condition of some more effective and adequate adjustment. While practically this function may be often performed in a direction *away* from its cause, as when we call out to a person in danger to look out, without stopping to tell him why he should look out, intellectually its office is turned *toward* the cause to modify it. And the *object of judgment* is thus not the cause simply; it is the consequence, the modification effected in its cause by the speech reaction. The speech response is retroactive as it were; not that it can modify anything which has passed out of existence, but it influences a contemporary act of vision and a tendency to reach or handle so as to give them a directed unity which they would not otherwise achieve save at the termination of a period of trial and error.

3. The analysis is still oversimplified. Speaking is connected with an ear and auditory apparatus, and their neuro-muscular and intra-organic connections. It is contrary to fact to identify a speech reaction with simply the innervation of the vocal organs. This gives no differentia of speech from a sigh, or grunt, or ejaculation due to respiratory reactions to pain. A speech reaction is the innervation-of-vocal-apparatus-as-stimulus-to-the-responses-of-other-organs-through-the-auditory-apparatus. It involves the auditor and his characteristic reaction to speech heard. Often and primarily the auditor is another organism whose behavior is required to complete the speech reaction, this behavior being the objective aimed at in the speech reaction.[3]

When the speech reaction consists in a "silent" innervation the principle is the same. It is then addressed to our own ear and the total connections thereof. Instead of making a command, or giving warning or advice to another agent for him to react to, we address it to ourself as a further re-agent. The agent issuing the stimulus and the one receiving it form two agents or persons or behavior systems. Failure expressly to note the implication of the auditor and his further behavior in a speech reaction is, I think, chiefly responsible for the common belief that there is something arbitrary, conceived in the interest of upholding a behavioristic theory at all cost, in identifying thought with speech. For when speech is confined to mere vocal innervations, the heart of knowledge is clearly not there. But neither is the heart of speech. Introduce connection with the responsive adjustments of the audience, and the forced paradox disappears. We have, as Mr. Mead has shown, the conditions for meaning.

[3] This is the point which is brought out so effectively in the article by Mead already referred to.

A speech reaction is a direction to subsequent behavior: Look and see; listen and hear; jump, turn to the left—remarks addressed to another who is in connection with ourselves, a partaker in the same behavior system, and then to ourselves, as a further re-agent, when there is no other person present.

Commands, optatives and subjunctives are the primary modes of speech reaction; the indicative or expositive mood is an amplification. For example, even a treatise by a mathematician or chemist is a guide to the undertaking of certain behavior reactions—a series of acts which when executed will result in seeing the things which the author has responded to with certain statements. It follows that the *object* of a speech reaction is the concordant responses which it sets up. Antecedent stimuli are a part of this object but are not the complete object of knowledge; the latter involves the further determinations which antecedent stimuli undergo by means of behavior evoked by speech. The object of knowledge or speech is the ultimate *consent* of the coördinated responses of speaker and hearer; the object of *af*firmation is the *con*firmation of co-adapted behavior. Its object is that future complex coördination of serial acts into a single behavior-system which would not exist without it. One's responses are co-adapted to the auditor's and the auditor's to one's own. Certain consequences follow.

1. The first is the refutation of solipsism. Not only can two persons know the same object, but a single personal reaction *can not* know an identical object. As a single and singular being I may make a primary non-cognitive reaction to a stimulus. I may shiver when the ear is stimulated in a certain way. But when I say, "that is the noise of a saw" the statement is addressed to the responses of an auditor in such a way as to demand a concordant reaction. He listens and looks, and says, "no, that is the sound of an axle of a wheel." Then I have to look, to respond with further behavior. The speech reaction is not complete till a concordant response is established. In other words, speech is conversation; it involves a duality of experiences or views. A single presence or view does not constitute judgment or statement. This particular manner of putting the fact may be unusual but there is nothing strikingly novel in the conception. Cognition involves recognition, acknowledgment, a contrast and connection of two different times or places of experience by means of which a distinctive identification is set up. A single act can not, as singular, establish the identification required to characterize an event as an object. There must be recurrence in a slightly different context. This is a thing that requires a response like that made before, or which will exact a

like response in the future, or of some other re-agent in the present. And without the sameness or correspondence of the responses of the two times or places, there is literally, contra-diction. An object of knowledge must consistently cover or comprehend responses to at least two distinct stimuli.

2. This conclusion has a direct bearing upon the nature of the correspondence which defines truth. The correspondence is found in the inclusion in a single contemporary behavior system of diverse behavior reactions. No correspondence can be conclusively established between a present response and a past one in their separation, or between a present one and a future one in their separateness. There must be one harmonious behavior function which includes the elements of both. Mr. Mursell in the article referred to makes correspondence retroactive. He says:[4] "When I assert that Cæsar crossed the Rubicon, I am reproducing the original reaction made by observers two thousand years ago, who saw him splash through the stream and found in the sight a stimulus to the response 'He has crossed the Rubicon.'" This account involves the mistake pointed out in the case of the statement "this is red color." It assumes that the object is known and also truly known prior to the speech reaction. How do I know that some former observer made the speech reaction ascribed to him? This ascription is the point at issue, and the account quoted merely begs the question. A correct statement of the data that Mr. Mursell recognizes would be: "I say that an observer two thousand years ago said that Cæsar has crossed the Rubicon; then I reproduce that saying on my own account. Then I say that the two sayings agree or correspond." Undoubtedly they do. But at no point have I got beyond my own sayings. The correspondence is merely between a saying of my own about what some one else said with another saying of my own. There is only a new kind of solipsism, that of private speech. In this historical case, I clearly can not direct my remark to a man long since dead and secure concordant behavior response from him. But I do address myself to others and say that if they will look at historic records, including those of a subsequent course of events, their responses will correspond to mine—or that the different reactions will all enter into a single complex behavior system.

Another illustration of Mr. Mursell's brings out the same points. He says: "Suppose I say Napoleon's tomb is in Paris. Let us assume that I read the words somewhere. Pushing back along the chain of recorded responses of which the printed symbols that I

[4] P. 187.

saw are the last, I come finally to the place where the original observer, who started the whole series, stood. I am directed to a particular locus, and there I receive a stimulus that issues in the response, 'Yes, Napoleon's tomb is in Paris.' And this it is which constitutes the truth of the judgment. . . . The chain of recorded responses always directs us to some specific locus."[5] The last statement must be unqualifiedly admitted. But what and where is the locus? If it is merely past—and not a stimulus-response continuing into the present—then I can only state that "I say that an original observer said that the tomb is in Paris." In short, as I push back along the chain, I finally come after all only to my own saying about what another said. If I go to Paris then indeed I come upon quite another saying which is congruous with my prior saying that the tomb is in Paris, but in this case the object is not one of a retroactive response. Or, I may respond without going to Paris in such a way as to call out reactions from other persons who make the same deliverance—that the tomb is in Paris. Here also the object is the attained co-adaptations in behavior.

Supposing we take a judgment about an event in the geological ages preceding the existence of human beings or any organisms possessed of speech reactions. In such instances, it is clear that there can be no question of correspondence with the speech reaction of a contemporary observer. By description the retroactive correspondence of sayings is ruled out. Yet no one doubts that there are some judgments about this ancient state of affairs which are truer than others. How can this be possible, since there can be no question of reproducing the judgment of an observer? If we say that what we now judge is what a contemporary observer would have said if he had been present, we are clearly begging the question. Nor could a contemporary observer have made as accurate and comprehensive a judgment in some respects as we can make, since we can also judge what occurred at a given period in the light of what happened afterwards. Clearly our speech reaction is to observations of present perceptions of data, rocks, fossils, *etc.* The other auditor and speaker to whom the statements are addressed are other possible observers of these and similar data. The ulterior "object" is the concordant, mutually reinforcing behavior system, including, of course, the speech responses. Sciousness in this, as in other cases, is con-sciousness. And this equating is not a mere figure of speech; it gives the original meaning of the word.

Summing up, we may say that there are three types of response which it is necessary to distinguish. First, there is direct organic response-of-the-autonomic-and-sensori-central-motor-systems-to

[5] *Op. cit.*, p. 188.

stimuli. These stimuli are not, for and in the reaction, objects. Their connection with response is causal rather than cognitional. The reaction is physico-chemical, though it may terminate in a spatial or molar change. Neither the stimulus nor the response is an object of knowledge, though it may become part of an *object-to-be-known.* If the stimulus were adequate or complete, complete adaptative response or use would take place. Being incomplete, it is a challenge to a further response which will give it determinate character. Thereby the to-be-known becomes an object of knowledge; it becomes an answer instead of a query.

Secondly, the speech response occupies an intermediate position. By clinching, fixing its stimulus, it releases further modes of response. Saying that the colored patch is red enables us to take it as the thing we have been hunting for, or to react to it as a definite warning of danger. The prior activities form part of the subject-matter of the thing thus known. But they are *not* the object known. The object known is the coördination of the prior behavior with the consequent behavior which is effected by the medium of speech. Till the assumption is banished that stimulus to knowing and object of knowledge are the same thing, the analysis of knowledge and truth will be confused. Thirdly, the eventual coördination of behavior involves the response of a further re-agent, namely, the auditor, whether another organism or one's own. This coördination of the activity of speaker and hearer forms the ulterior object of knowledge. As a co-ordination or co-adaptation of at least two respondents, it constitutes that correspondence which we call knowledge or truth. Correspondence of past and present responses can be determined only by means of a further response which includes both of them within itself in a unified way. The theory explains the relation of truth to consistency as well as to correspondence. The different responses must consist, cohere, together. Consistency gets an objective, non-mentalistic meaning when it is understood to mean capacity for integration of different responses in a single more comprehensive behavior.

We may conclude by suggesting a possible explanation of the oversimplification of the behavioristic account of speech which has been pointed out. Introspective psychology of necessity broke up the subject-matter of psychology into a number of *disjecta membra,* of disjoined fragments treated as independent self-sufficing wholes. I say "of necessity" because the connecting links of these fragments are found in a context of environmental conditions and organic behavior of which the introspectionist can not be aware. Now behaviorism has too often confined itself to finding behavior-

istic counterparts of the same material and topics with which introspective psychology has dealt.[6] Consequently actual and concrete behavior has been broken up into a number of disjoined pieces instead of being analyzed freely on its own account. Thus certain errors of introspective psychology have been reduplicated in the very behavioristic psychology which is a protest against introspectionism.

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PROFESSOR PERRY'S EMPIRICISM

THE present age may not unfairly be characterized as one intent upon immediate results. The remarkable achievements of the sciences, pure and applied, seemingly put the philosopher, the plodding student of ultimate principles, to shame, unless he, too, can produce for the edification of an insatiable public some new and novel contributions pointing directly to the advancement of the individual and social good. While psychologists are busy devising intelligence tests, or performing hypothetical experiments upon the human being, under the inspiration of "behaviorism," quite as if man were a lower species of animal, the philosopher must evidently do something to "save caste," at least by way of showing his interest in such scientific advances.

To the attempt to keep in touch with these latest developments and to express his views on the various ethical and sociological problems associated with them, Professor Ralph Barton Perry is devoting his best attention; it is, therefore, by the study of his writings that one may hope most conveniently to gain an understanding of the philosophical implications involved in these movements. It is possible, however, that in his preoccupation with the treatment of specific details, the reader may sometimes lose sight of the fundamental principles upon which Professor Perry's particular solution of these problems depends. Such being the case, it seems essential to pass in review Professor Perry's various utterances with the special purpose of bringing these principles and presuppositions to light; to see in general how he conceives of the relation

[6] The case is quite analogous with the situation described by Mr. Kantor with reference to the nervous system. See his article in this JOURNAL, Vol. XIX, p. 38, on "The Nervous System, Psychological Fact or Fiction?" As Mr. Kantor states, too often "the nervous system is taken to be the tangible counterpart of the intangible psychic." Similarly, certain modes of behaviors have been treated as objective substitutes for prior subjective entities and processes.

between science and philosophy; and in particular what is his theory of the nature and functions of the mind.

In his Presidential address before the American Philosophical Association, December, 1920,[1] Professor Perry presents a brief summary of many of the views expressed in his previous articles, so we may conveniently use that paper as the starting point of the present discussion, supplementing it, when necessary, by reference to his other writings.

Professor Perry declares in this address that ". . . the great philosophical enterprise of the immediate future is the naturalistic study of man as a part of nature, interchangeable and interactive with his environment."[2] To accomplish this purpose entails, to his mind, what some of his readers may consider a particularly novel conception of the relation between philosophy and the natural sciences, including within that division psychology. "The leaders of contemporary thought, such as James, Bergson, Dewey, and Russell, are distinguished by the utter lawlessness with which they introduce philosophy into their psychology and psychology into their philosophy. Perhaps they do not know the difference; in any case they ignore it. . . . Scorning schematic barriers and scientific etiquette they bluntly assume that the facts about human nature are all to be found in one place, and that it is not significant by what door you enter."[3]

In other words, both philosophers and psychologists are in search of the same facts, and, forsaking dialectics, are to "observe what actually transpires."[4] Not "idle speculation," but "direct observation" is to be the source of all our knowledge, both scientific and philosophical. And, to make more explicit his point of view, Professor Perry remarks that ". . . a careful effort to describe the act by which a knower selects his object, or the act of meaning, or the act of sense-perception, will inevitably lead an *empiricist*, . . . to attach central importance to the functioning of the physical organism."[5]

What, first of all, is said in general of such a notion of the relation between philosophy and science? Professor Perry has stated his case with such cheerful and dogmatic assurance that the reader is justified in demanding conclusive evidence in its favor. Certainly it is not supported by a historical study of the course of human thought; never in the past have philosophy, and either science

[1] "The Appeal to Reason," *Phil. Rev.*, XXX, 2, pp. 131–169.
[2] *Phil. Rev.*, XXX, 2, p. 136.
[3] *Ibid.*, p. 137.
[4] *Present Philosophical Tendencies*, pp. 322–3.
[5] *Phil. Rev.*, XXX, 4, p. 407 (italics mine).

in general, or philosophy and any particular science, for long employed the same methods or occupied themselves with identical problems. In the very nature of the case, and for the sake of clarity in defining issues, it would seem that certain fundamental distinctions between philosophy and science must be maintained. So long as science must resort to abstraction in order to attain its legitimate ends, just so long must philosophy point out and even insist upon the necessity of a reinterpretation of scientific conclusions in the light of the more ultimate principles, immanent in experience as a whole rather than in any one part of it, which it is the proper business of the philosopher to bring to expression. Surely it is to the advantage both of the scientist and of the philosopher to recognize such a distinction as this, and it would not be difficult to suggest other important differences, *e.g.*, those concerned with the problem of values.

Then again it is a question whether or not the "leaders of contemporary thought" whom Professor Perry mentions as his sole authority in support of his contention of the present-day interconnection between psychology and philosophy, would themselves accept his statement on their behalf. Bergson, for example, insists that science fails to grasp the concrete nature of things simply because it is doomed to proceed by means of the abstract categories supplied by the intellect; to get at reality the philosopher must employ another faculty, more suited to its task, namely the intuition. There could hardly be a sharper distinction, at least in methodology, between the two fields. And of course there are other contemporaries, whose views are quite as worthy of respect as are those of the authorities he cites, who would very definitely reject Professor Perry's viewpoint.

Nevertheless, the adoption of any other point of view than that represented by his fellow empiricists, is contemptuously cast aside as due to "sentimental" or "religious" prejudices.[6] Such "pure speculation," it is urged, may be a harmless enough pursuit, like a day-dream, but it is as little in touch with actual experience and the "facts" of human existence. That is to say, Professor Perry deliberately refuses to recognize as facts worthy of serious philosophical consideration, any particular facts other than those involved in the functioning of the physical organism. To be a fact means, then, it would seem, to be expressible in biological categories.

With the material adequacy of this conception we shall deal in the later part of the discussion. Our immediate concern is with the nature of the "scientific" method which is held to be so all-im-

[6] Cf. *The Present Conflict of Ideals*, pp. 378–9 and *passim*.

portant. It seemingly is implied in the passages quoted above that by mere observation we may hope to discover the facts about human life and experience, and then, presumably, will go on to formulate the significant laws of human nature on the basis of these previously discovered facts. But quite irrespective of the identity or non-identity of philosophical and scientific methodology, science, simply *qua* science, does not, and logically can not, follow such a procedure. Scientific experience flatly contradicts the assertion that there are bare original particulars, existing by themselves, as, *e.g.*, the doctrine of external relations would seem to imply, upon which the scientist proceeds to direct his observation, for the purpose of later framing laws and hypotheses about them. For the scientist a fact is a fact—can only be a fact—in so far as it is already associated, or capable of association, in his experience, with other facts, forming a more or less consistent system. In other words, to possess any scientific significance, to exist at all for the scientist, or for that matter, for anybody, particular facts and general laws logically imply each other, and are inseparable aspects of a systematic dialectic.

It seems, therefore, that not only is Professor Perry's conception of the relation of science to philosophy open to criticism on the basis of the nature of the problems with which they are respectively concerned, but that so long as the methods of science itself are in dispute, no correct solution of the larger problem can be hoped for. Let us, however, except for these cursory remarks, waive for the moment both the very dubious conception of philosophy as sharing the same problems with psychology or any other sciences, and the complementary assertion of identity of method in the two cases. Let us rather turn to an examination of the particular facts which Professor Perry has discovered, by observing "what actually transpires" about human consciousness and some of its typical products. For after all, "the proof of the pudding is in the eating," and in a certain sense the proof of any method in philosophy lies in the results which it achieves; in the degree to which it serves adequately to explain our actual experience. We shall see that not only do these facts fail to represent the real nature of man's mind, but—what is, if possible, even more serious from Professor Perry's standpoint—that they even prove adequate to the task of defining consciousness in agreement with his own philosophical principles, and therefore, require considerable supplementation from the abhorred field of "pure speculation."

First as to consciousness. In *Present Philosophical Tendencies*[7] it is defined, in accordance with the principle of attaching "central

[7] Pp. 322ff.

importance to the functioning of the physical organism," as "a species of function exercised by an organism." It is "a selective response to a pre-existing and independently existing environment." Now, however adequate such a definition may be for the immediate purposes of psychology—and perhaps we may leave it to the scientific psychologist to decide the question for himself—the philosopher, it would seem, is in duty bound to point out the obvious abstraction contained in it. For of what "fact" can a serious empiricist be more certain than that an "independently existing environment" is not a part of his actual experience? At every instant, to examine the matter no further, man is transforming this supposedly independent environment; indeed his very presence in the world is already an implicit transformation in the shape of added values and deeper meanings. Thus a more flagrant case of "pure speculation" it would be difficult to mention. There is no element in concrete experience that it serves to explain; it stands there on its own merits as an unwarranted assumption which the philosopher would do well to avoid until all other more concrete possibilities had been exhausted.

But Professor Perry does not rest here; he proceeds to locate consciousness existentially in space and time. We find (would Professor Perry say "observe?") that it is "only one kind of thing among many";[8] it intervenes as an arc in the causal circuit of the nervous system, comprised of stimulus at one end and response at the other.[9] But here is where observers apparently disagree, since the thoroughgoing behaviorist, the essence of whose method is observation, denies the existence of any such factor as consciousness. Parenthetically, we may remark that such confusion is due in part to an uncritical use of the terms "stimulus" and "response"; terms which some physiologists are learning to treat with more circumspection and care than formerly.[10]

However that may be, the further question naturally arises as to why it is necessary to conceive of consciousness, for scientific purposes, in existential terms at all. Many psychologists, except perhaps those who reject the concept altogether, would rest content with defining it, as indeed Professor Perry himself does at the outset, as a process, an activity, exercised by the natural organism. And, moreover, this is all that consistency with Professor Perry's psychological principles demands. Then why attempt to ascribe to

[8] *Present Philosophical Tendencies*, pp. 322–3.

[9] Cf. "A Behavioristic View of Purpose," this JOURNAL, XVIII, 4, pp. 85–105.

[10] McDougall, "Prolegomena to Psychology" in the *Psychological Review*, XXIX, 1, pp. 1–43.

it characteristics usually associated with physical thinghood? The answer is, as indicated above, that the merely scientific account proves inadequate for philosophical purposes and hence must be supplemented by certain hypothetical principles of neo-realism. Thus the account of the neo-realistic solution of the riddle of the dualism of mind and body runs as follows: "Consciousness is homogeneous with the rest of the world in the sense that it is composed ultimately of the same elements"[11]—or "neutral entities." That is, consciousness, a tree, man, a mathematical system,—in short, whatever in any sense exists, or may be thought about—reduces by realistic analysis to these same neutral entities. But a neutral entity, whatever else it may be, is not an empirical fact; it possesses no properties amenable to scientific or to logical scrutiny; it has nothing to do with the functioning of the physical organism, empirically considered; it is simply a metaphysically postulated element conceived, principally, it would seem, for the purpose of constructing reality out of bits.

Such is the stratagem to which Professor Perry's neo-realistic empiricism is forced by a natural logic more powerful than any resolution an individual thinker or group of thinkers may form not to recognize it. However much he may insist upon construing reality "scientifically" in terms of particular observed facts only externally related to one another, however much he may resolve to focus attention solely upon the particular physical organism, the neo-realist is at last driven to posit some sort of a logical connection, an artificial universal, to take the place of the real universal binding these particulars together. Having forsaken the real universals displaying the identity in diversity actually found in experience, he is obliged to adopt as a substitute some logical fiction such as the neutral entities, thereby reducing the articulated universe to a bare and formal identity wholly unlike that known to concrete experience. In other words, we are contemplating the logical results of artificially separating factors, such as the individual and the external environment, which actually are intimately bound together in the concrete whole of things. It is the attempt to employ in philosophy the method so successful and legitimate in science—the tool of abstraction. So that how Professor Perry is to reconcile his insistence upon the employment of solely empirical "scientific" methods of direct observation in the acquisition of the "facts" of experience with the purely speculative theory which he as a philosopher sees fit to adopt, we must leave to him to explain. One thing is evident, namely, that not the facts alone or even

[11] *The Present Conflict of Ideals*, p. 376.

principally, but certain assumptions, furnish the real basis of his conception of the nature of consciousness. Yet it is not against the making of assumptions that one may complain, for all thinking involves such a factor,—though, incidentally, Professor Perry's own principles seem logically to preclude for him the making of them—but rather the uncritical, dogmatic assertion of these particular ones, as if they required no examination as to adequacy but were self-evident and directly derived from the facts of experience.

Thus the net result of the application of Professor Perry's empiricism to the facts of consciousness is failure to derive a consistent or satisfactory account of its nature. The great wonder, however, is, not that the outcome of such a self-contradictory procedure should have resulted in failure, but rather that it could ever have been thought to possess any possible value as a method of philosophical explanation. It should serve as a concrete example of the results to be expected from the attempt to disregard the logical principle that form and matter mutually condition each other; that there is no general abstract logical constant or bare identity such as a neutral entity, which can be applied effectively and indiscriminately as a principle of explanation to each and every part of experience on the general assumption that all experience is reducible to the existential or quasi-existential terms of natural science.

Indeed, a close inspection of Professor Perry's various writings only goes to confirm the first impression that we have to do with a serenely naïve point of view with regard to, for example, such problems as that of the nature of the mind, quite on a level with that of the ordinary uncritical writer of text-books on physiological psychology. He makes no attempt to examine the presuppositions involved in such an attitude, and the outcome, thus far at least, of the identification of science and philosophy, as proposed by Professor Perry, is, therefore, a mere juxtaposition of certain philosophical principles, not cogent to the problems at hand, with the uncriticized results obtained from a narrow field of scientific investigation.

And when we turn from a consideration of his conception of the nature of consciousness itself to his application of the conception to an interpretation of such mental products and activities as purposiveness and belief, we shall see that here, even more explicitly, the attempt to unite philosophy and science in a single, identical enterprise, results in a merely scientific outlook, with all of its attendant abstractions and naïveté.

"Biologists," Professor Perry declares, "and even chemists are discussing teleology with open and receptive minds."[12] This re-

[12] *Phil. Rev.*, XXX, 2, p. 136.

mark is important because our writer says elsewhere: "Man and his faculties belong to the fields of the biological sciences and are therefore subject to the methods and laws which are proper in that field."[13] Evidently we may expect that human purposiveness as well as consciousness will be defined in accordance with the biological categories. We may conceive of the human mind, Professor Perry explains, as a "unified reaction-system which . . . will control both the internal adjustments of the organism and its dealings with the external environment." If the response be impeded by an obstacle a series of trials and errors ensue until a reaction occurs "by which the impediment is removed."[14] "The object exciting the successful response will thereafter be charged with a meaning or will partially reawaken that same response. . . . When a response occurs on that account, that is, when an act is performed because in its implicit form it coincides with the unfulfilled phase of a determining tendency, we may say that it is performed purposively."[15] Note, moreover, that "a belief of some sort, an act of the intellect which is either true or erroneous, is . . . invariably one of the factors in a complete human act. . . . These two factors [belief and determining tendency] unite to constitute purposive action. . . ."[16] That is to say, we use our intellect as a complement to our other faculties to perform ideal experiments to determine how particular ends may successfully be attained. In Professor Perry's own words, "The function of the intellect is the acquisition, testing and application of true beliefs. A belief is an anticipatory response set for a *specific* occasion, and its truth lies in the complementary relation between the response and the occasion. [The truth of] a belief is tested by trying the response on the occasion, or by trying it conjointly with other responses whose truth is assumed, or by comparing it with the responses of others."[17]

So far human purposiveness seems simply to refer to "an organism endeavoring to find its way in the midst of nature."[18] But, as if convinced of the inadequacy of this purely biological point of view Professor Perry seeks to do justice to the claims of more particularly "spiritual" interests. "That there is an interest in truth, or a specifically theoretical activity, which may assume a dominant rôle in an individual life, is a brute fact of human behavior."[19] Surely here, if anywhere in Professor Perry's system,

[13] "The Integrity of the Intellect," *Harv. Theo. Rev.*, 1920, pp. 222–3.
[14] *Phil. Rev.*, XXX, 2, p. 139.
[15] *Ibid.*, p. 139–40.
[16] *Ibid.*, p. 143.
[17] *Ibid.*, p. 157. (Italics mine.)
[18] *Ibid.*, XXX, 2, p. 140.
[19] *Ibid.*, p. 139.

we may hope to come upon a distinctively human end. Here at last we shall discover the mark that raises man above the brute, and reveals him as more than a merely life-desiring physical organism. Here we shall learn the true meaning of the phrase, "it is the nature of the mind to know." And we read on, ". . . truth being the value which attaches to a hypothesis or idea in so far as it fits the environment. The technique of induction is the technique of contriving such *determinate* expectations as can bear the ordeal of empirical fact." [20]

But this is only to repeat what we had already learned; the "independent" activities of the intellect neatly narrow themselves until they fit wholly into the previously prepared biological categories in accordance with the cardinal principle of attaching central importance to the functioning of the physical organism,—which is, after all, we must admit, as much as we could expect of a naturalistic empiricism if it is to be self-consistent. That is to say, we have discovered the empirical facts about human nature, and "all in one place," as it was promised that we should. Purposiveness, belief, truth, as well as consciousness are construed on the basis of the relation of the independent, *i.e.*, merely *subjective*, individual to the external environment. The sole function of man's mental attributes consists, in the last analysis, in the fitting of specific responses to determinate occasions. And this, we must bear in mind, not merely for the more immediate purposes of natural science; it is considered to be an ultimate philosophical position.

Now the principal criticism that may be directed against such a conception of the nature of purposiveness, belief, and truth,—or of mind in general—is, not that it is wholly false to the facts of experience, but rather that it does not cover all the facts. Obviously, however, it follows from this objection, if valid, that Professor Perry's views do not adequately account even for those facts assumed to be the sole ones observable as constituting human experience. And it may be said at once that his failure to do justice to the nature of such conceptions is largely inherent in the previously noted logical weakness of his abstract, "scientific" method of interpretation of experience. In the following paragraphs, therefore, we shall attempt to indicate some of the most obvious shortcomings, as we see them, implied in Professor Perry's assumptions.

We have already pointed out the abstraction contained in the use of the phrase "external environment," while tentatively admitting its validity under certain definite conditions, for the purposes

[20] *Harv. Theol. Rev.*, 1920, p. 228. (Italics mine.) Cf. also *Present Philosophical Tendencies*, pp. 323ff.

of science. But indeed one may question even the scientific relevancy of the term, if it is taken to signify *pure* externality. Yet this is apparently its meaning for Professor Perry, based as it is on his doctrine of external relations. We must insist again, however, that such abstractions have no place in an ultimate account of things such as philosophy professes to be. Philosophy, if not science, must recognize that man is not superadded from the outside to a strange and foreign world; rather he is part and parcel of his world and it of him. If now we find it necessary to consider the environment apart from man's relation to it, as, *e.g.*, in the physical sciences; or if we may profitably consider man apart from his environment, a very doubtful hypothesis for any science, we have always to remember that ultimately the two factors are not independent but complementary. We began by making an obvious abstraction; we should conclude by reuniting what we momentarily tore asunder. This is only to say that the distinctions which we make between mind as such and nature as such ultimately fall within the concrete whole of things.

Granted that this be true, it is obvious that an attempt to explain or describe purposiveness, belief, or truth in terms of the relation of an individual to an "independent" and "external" environment, however broad a sense we may apply to the latter term, is bound to result in failure. At the very start of our attempt to attain an adequate philosophical insight into the nature of things we prejudice our cause by limiting our vision to an arbitrarily specified field bounded by abstract biological categories.

A specific example will perhaps serve to make clear the distinction between Professor Perry's views and those of a more satisfactory alternative position. A human being, let us say, *is* a physical organism, in time and space, composed of chemical elements, and possessing a life-history. But what is thus true at certain stages of knowledge, *e.g.*, the biological—falls far short of the whole truth at the stage at which such a human being assumes his place in society as a member of a family, a friend, a political associate. What binds him to other members of society depends in part upon physical and biological conditions, but certainly not less upon intellectual, esthetic and ethical considerations. These higher phases include and transform the significance of the lower ones. The merely external aspects are transcended, though preserved, through the recognition that mind is the binding thread which unites the particular individuals in a systematic whole.

In such a sphere, which, be it noted, is only the rightful heritage of man as a human being, thought is not forced to satisfy its

natural tendency by seeking identity in artificial abstractions, *e.g.*, neutral entities, below the range even of the physical sciences. Rather the difficulty of finding this identity becomes less as the standpoint progressively approaches that of thinking, rational beings,—our fellow-men. Once past the mechanical standpoint of physical science, perhaps even *in* physics, this bare and formal identity begins to develop within itself the complementary aspect of diversity—a diversity which does not destroy but only adds to the richness and concreteness of the identity.

From this standpoint we may retain, so far as valid, Professor Perry's interpretations of purposiveness, belief, and truth, but it is highly important to recognize that while retained, they are also quite as surely transcended. For example, it is doubtlessly true in a sense that the individual must occupy himself with the framing of "determinate" responses to "specific" occasions in which he finds himself involved in the round of daily experience. But it is quite obviously an abstraction to seek the whole meaning of his conduct in such transient acts. A life organized on such a plane of animal existence is just the one Socrates cried out against as not fit for a man to live. And besides all this, there is to be accounted for in any system of philosophy worthy of the name, the fact of man's interest in—quite as they are for themselves, and apart from any survival value they may incidentally possess—"the good, the beautiful, and the true."

Religion, art, and philosophy, we like to believe, are more than mere expressions of animal behavior, or the result of sentimental prejudice for idle speculation. They are ways of giving utterance to man's sense of oneness with, and of participation in the universe (including of course the natural environment) as a whole. As such they possess a value, a meaning, not expressible, it is true, in biological categories or in terms of abstract empiricism, but none the less real and philosophically significant for all that.

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BEHAVIOR AND PURPOSE

THROUGH the importance assigned to objective conditions as contrasted with subjective, and to methods of behavior as contrasted with beliefs, the present century has witnessed the development of a new emphasis in philosophic and psychological in

terpretation. We no longer attribute preëminent importance to the individual's conviction, but ask for objective biography rather than for introspective autobiography. Not what a man says but what he does gives us the fruitful insight into his character; when saying and doing tell different stories we accept the latter as the faithful record and call the former misstatement. Our interest in the latter, in the doing, is not to be explained as getting us nearer the truth, since we may as correctly ascertain what a man thought as what he did; it is to be explained as due to our feeling that the latter method gives us better insight into what is of most importance. This method of interpretation has been fruitful of results and promises even more than present performance, indeed, is but the threshold of a new understanding. The path along which it beckons leads into a land of promise whose first fruits are heartening. But, as happens with new points of view, there are misunderstandings and misapplications.

The behavioristic view is sometimes interpreted by its champions as ruling out purpose and "ethics," as being in itself self-sufficient and irreconcilable with our previous standards of procedure. We believe this to be true only in part, and to a smaller extent than is commonly admitted by the supporters of behaviorism. So far from true is it that "ethics" is irrelevant to behavior that one might say it is never irrelevant. The possibility of reducing all ethics to forms of behavior has, as its supplement and counterpart, the possibility of reducing all behavior to ethics. Analysis of altruism into sympathetic behavior which simply behaves in that classifiable manner does not preclude ethical analysis of sympathetic behavior, nor of the behavioristic classifier.

Behavior is not just *behavior*. It is behavior of a certain drift or drive,—otherwise it were useless to classify it as behavior. When the behaviorist puts forward his thesis he does so with a purpose in his behavior, not merely that he may behave. Behavior is not of equal or indifferent significance. Some sorts are of great importance for human beings, others are relatively unimportant—a truth so obvious that only a persistent blindness to it in some quarters can justify the near tautology. The test of behavior should be behavior itself, indeed, must be in terms of behavior. But by what sort of behavior shall we test behavior? What shall be our standard and how shall it apply?

The significance of behavior, let it be submitted, must be adjudged in the light, not of similar nor of less, but of larger and more inclusive schemes of behavior. At any moment my walking from my house to the letter box can be analyzed as putting one step

ahead because the other is behind, as a continual catching myself from falling in the direction in which my body is moving, as an intricate system of muscular checks and balances calling into service an intricate nervous system of finely adjusted interactions. Such a cross-section analysis of my activity may be correct in every detail yet be relatively meaningless as an explanation of my activity. Its explanation can be found only when the cross-section is made lengthwise, and includes my whole procedure from house to mail box. The significance of the detailed behavior becomes evident only in the light of my larger and more inclusive behavior. This last-mentioned behavior is, again, only relatively self-complete, and for more complete understanding must be related to my larger schemes of behavior. In other words, any detail of my behavior is a phase of all my behavior, often as important a phase of my future behavior as of my recent or remote past.

The systems of behavior represented by various living species of animals are not of equal import, much less are the systems of behavior represented by various individuals of equal import. Often, the significant thing about the behavior of an individual is its relation to the behavior which characterizes his historical epoch or his class. Man as a species represents types of behavior and man as a historical creature represents progressive changes in types of behavior. The importance we assign to individual behavior must depend upon the importance we assign to types of behavior. These types may be potential as well as actual ones, unrealized as well as completed histories.

As history itself, though concerned with the past, can never be concerned with the past as such, but must possess selective insight and philosophic guidance, so a psychology concerned with behavior can never be concerned only with behavior. It must be concerned with some types more than with others, with the significant rather than the insignificant. Behaviorism is a point of view and must justify itself by its fruits. It can classify under its categories, but must itself submit to classification. By whatever behavioristic term the test be called, behaviorism must submit to the test of significance and value.

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BOOK REVIEWS

Evolutionary Naturalism. ROY WOOD SELLARS. Chicago: The Open Court Publishing Company. 1922. Pp. 343.

This volume invites attention as the first published attempt to base a metaphysical system upon critical realism. Professor Sellars

believes that a new naturalism, supplanting the older materialism, is indicated when the categories are examined in the light of an adequate epistemology and when principles derived from a study of the biological sciences are given due importance in metaphysical explanation. The insufficiency of the older materialism is ascribed to its tendencies to hypostasize scientific concepts and to reduce biological to physico-chemical processes without a remainder.

Two chapters are devoted to an account of the epistemological foundation on which the author's metaphysics is based. This account does not differ from his earlier writing on the same subject. He maintains that physical entities are not objects in their own right, but are made such by the selective activities of the organism. Objects are known by means of data in consciousness which, however, are wholly subjective and existentially distinct from the objects known. Thus knowledge is not intuitive, as idealism and naïve realism suppose, but mediate. Nor is knowledge obtained from data which are copies of physical entities, for by means of data we know objects, not our subjective states. The adequacy of cognition rests on the fact that nature controls the knowledge-process in the interest of biological adaptation. The categories, therefore, are truly informative of the physical world, for "nature itself would need to change before they would become invalid" (p. 81).

The major portion of the book is given over to discussion of the individual categories. It is emphasized that there are different levels and contexts of interpretation from sensation to conception and abstraction, and that a true estimate of the value for knowledge of any category can be obtained only by a genetic consideration. The author finds these levels of interpretation continuous in the main and informative of the physical world. Thus the sensational elements of our spacial experience connect naturally with the conceptual, and even abstract mathematical space gives information about real space.

"Space as a category is not an external reality. To assert that the physical world is spacial, means, not that the physical world is *in* a non-dynamic receptaculum analogous to mathematical space, but that certain predicates are interpretative of its actual constitution and nature" (p. 99). These predicates are found in judgments of position, relative size, contour, distance, and direction. *"These elements give the very meaning of space as a category"* (p. 99). In like manner, "temporal contrasts should not be read too naïvely into nature" (p. 120). The world is temporal, rather than in time. Sellars subordinates the category of time to that of change; real time is change in the physical world.

In his treatment of things and their properties, the author reaches the conclusion that the distinction between substance and properties is epistemological rather than ontological. A substance is the subject of predication in a judgment. Hence it was supposed that there was a unitary and unknowable substance supporting properties. The true view, however, is that properties are simply the elements of our tested thought of the thing. Things *are* (partially) their known properties. All sense-data are materials for knowledge; all qualities are contentually subjective; the distinction between primary and secondary qualities rests on either an intuitional view of knowledge or a naïve copy-theory. Qualities and quantities are not opposed; colors, tastes, and odors, as well as shape and size, are indicative of physical conditions. But "in no case is there assumed to be a *resemblance* between a sense-datum and its external cause. What does hold is an ordered correlation so that to every difference in the one there is a difference in the other manifold. It is because of this ordered correlation that we are able to infer the size, structure, behavior, position and internal constitution of physical objects" (p. 188).

The evolutionary naturalist is a pluralist and is sympathetic with the doctrine of external relations as against logical monism. He finds, however, both continuities and discontinuities in nature, and he maintains that the question whether any particular relation is internal or external is to be decided solely on empirical evidence. Many biological relations are internal, and the character of their terms has become modified from the time when they entered into relation. Relations themselves must not be reified; there are terms *in* relation, not relations *and* terms.

Russell's mathematical analysis of motion, while defended, is declared not to be exhaustive. Motion, for Professor Sellars, is a case of behavior implying energetics, and back of motion lies force. He recognizes that if we use the concept of force as a principle of explanation instead of passing to a quantitative description of its manifestations, we shall get nowhere, but he says that the limitations of our knowledge should not be permitted to empty reality of any content for which we have an empirical basis. (One may question whether he has been equally scrupulous in respect to the empirical content of colors and odors.) We are urged irresistibly to the positing of force in objects by our fundamental realistic belief that bodies are something in themselves and have a determinate nature. But it is not admissible to follow idealism in its belief that the activity which we experience in consciousness is the only type of activity in nature.

We must avoid interpreting the world in terms of human agency, as well as the tendency to reduce causality to logical implication. Like other categories, causality is informative of reality. Causality is more than sequence, more even than a uniformity of sequence. It tells us that change is not adventitious, but that it "grows out of the very heart of that which changes. But, if so, change throws light upon the nature of the changing system; it is the kind of a system to produce this change as an end-term" (p. 248). A scientific treatment of causality as opposed to a naïve view seeks to appreciate, not two factors, but all the factors at work. Causality is not purely temporal; it is spacial as well, and it signifies the activity of a changing system.

Freedom, treated in the manner made familiar by the writings of Windelband and others, is reconciled with determinism by analysis of the meaning of these concepts. These attempts fail alike to explain the crucial instance of the exercise of freedom when the self is "divided." Novelty is regarded as descriptive of the evolutionary process, but not as in conflict with continuity. From Professor Sellars' own standpoint, I can not but feel that novelty would find more satisfactory interpretation as a subjective category. If real time is change in the physical world, novelty would be a concept that we would apply to the succeeding state as compared with the former, when there was a striking alteration in data. Empirical teleology is defended. It is especially apparent in organisms, where each organ has its function which assists in the working of the whole. "This ordering is maintained by structural and functional coördinations" (p. 337). We must be careful not to inject naïve anthropomorphism into the concept, but on the other hand we must not underestimate the physical world. The chapter which deals with mechanism and teleology is especially vague and inconclusive.

The fact that the structure of consciousness reflects the position and adjustments of the organism suggests that there is no existential independence of consciousness from the brain. The burden of proof that there is a separation rests upon dualism. "Evolutionary naturalism does not believe that the higher levels of nature are purely mechanical; it accepts critical points with resultant new properties" (p. 292). "Who has a right to say *a priori* how great a novelty may arise and so set limits to the possibilities of nature?" (p. 297). The author describes his view as a development of the double-aspect theory based on critical realism (p. 294). Consciousness, however, is not an aspect of the whole physical world, but a novel aspect of brain-activity, functional in char-

acter. The biological sciences indicate that an organized system is more than the sum of its parts, and that a whole may exert control over its parts. Thus consciousness is efficacious. The brain is "a stream of tendencies lit up by consciousness" (p. 316). "The contents of consciousness are correlative to neural processes which are not found at the inorganic level. They come and go, and yet, as memory shows, they are not completely lost. . . . The difference between the conscious and the unconscious must be one of degree and not of kind" (p. 318).

Critical realism steers a middle course between skepticism and intuitionism. When a critical realist seeks to build a metaphysical system in harmony with his epistemology, one is interested in watching how far his faith will carry him. Faith here is acceptance of data as revelatory. The question arises (and the answer given will vary with the individual thinker), what aspects of the conscious content shall be accepted as mediating knowledge of a reality beyond the knower? Professor Sellars finds his answer to this question in his faith in the results of the special sciences, the achievements of enlightened common-sense. That he is not entirely successful from the metaphysical standpoint is partly due to the limits which bound his faith. But one wishes that he had broadened somewhat his own method of investigation. He is so deeply interested in inquiring about the nature of the physical world that it has not occurred to him that a correlative study is that of the characteristics peculiar to conscious processes. He has studied the character of data only in reference to their cognitive value. Now science reaches knowledge that is *formal* in character. And the knowledge of the physical world which Professor Sellars defends is, correspondingly, a knowledge of "size, structure, behavior, position, and internal constitution of physical objects." But he has not explained by a study of the conscious process the reason why knowledge is thus limited. He has chosen rather, except perhaps in his treatment of force, to ignore the fact that physical science can not do without a fundamental substance, whether ether or electricity, and to assimilate naïvely substance and quality to structure.

While this mode of procedure is not entirely unconvincing in his discussion of the inorganic, it encounters vast difficulties when he comes to treat the mind-body problem. Here the only correlations of which he can speak are those of structure and function. The warm, sensuous characteristics of conscious qualities have not been anticipated by a slow evolution of substance. They burst out of structural properties in a way that Professor Sellars can de-

scribe only by the word "novelty." We must not indeed "set limits to the possibilities of nature," but reason herself sets certain limits beyond which she encounters the irrational. If, as the author himself avers, in conscious activity alone we are "on the inside," evolutionary naturalism might lead more readily in the direction of pan-psychism or Haeckel's monism. Either of the latter would afford a better escape from dualism—which, of course, is equally compatible with critical realism.

Professor Sellars is to be commended in his attempt to square critical realism with naturalism. His writing suffers, however, from a disorderly style. The headings and sub-headings of the individual chapters are clear, but their matter often reads like a note-book, rather than like a finished treatise. This fault is unfortunate in an age when philosophers are striving to reach mutual understanding.

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JOURNALS AND NEW BOOKS

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PSYCHOLOGICAL REVIEW. Vol. 29, No. 5. September, 1922. Behavior and the Central Nervous System: *A. P. Weiss.* How are Our Instincts Acquired? *Zing Y. Kuo.* Intelligence and Learning: *J. Peterson.* The Organismal Point of View in the Study of Motor and Mental Learning: *J. A. Melrose.*

REVISTA DE FILOSOFÍA. Vol. VIII, No. V. September, 1922. Amadeo Jacques: *A. N. Ponce.* El monismo estético de Vasconcelos: *G. P. Troconis.* La historia de un ciencia: *R. A. Orgaz.* El pensamiento de Juan Montalvo: *F. Córdova.* El progreso y los espacios de tiempo: *A Spinelli.* Antecedentes de la filosofía en Bolivia: *D. Eyzaguirre.* Enseñanza de la filosofía en Bolivia: *C. López.* Mérito, Tiempo, Estilo: *J. Ingenieros.*

JOURNAL OF EDUCATIONAL PSYCHOLOGY. Vol. XIII, No. 6. September, 1922. An Experiment in Learning an Abstract Subject: *E. L. Thorndike* and *E. A. Lincoln.* A Class Experiment in Learning: *W. F. Dearborn* and *E. A. Lincoln.* Language Error Tests: *G. M. Wilson.* Some Evidence of an Adolescent Increase in the Rate of Mental Growth: *K. Murdock* and *L. R. Sullivan.* Tentative Order of Difficulty of the Terman Vocabulary with Very Young Children: *M. V. Cobb.* Some Retests with the Stanford-Binet Scale: *K. Gordon.* "The Constancy of the IQ" again: *F. M. Teagarten.*

Aliotta, Antonio: Relativismo e Idealismo. Naples: F. Perrella. 1922. 99 pp.

Aristoteles: Lehre vom Beweis—oder Zweite Analytik. A new translation with an introduction by T. E. Rolfes. Leipzig: Felix Meiner. 1922. 163 pp.

Kant, Immanuel: Vermischte Schriften. With Introduction and Notes by Karl Vorländer. Leipzig: Felix Meiner. 1922. 324 pp.

McTaggart, J. McT. E.: Studies in the Hegelian Dialectic. New York: Macmillan Co. 1922. 2nd edition. xvi + 254 pp.

NOTES AND NEWS

Professor A. N. Whitehead of Cambridge University has been elected president of the Aristotelian Society for the coming season. His inaugural address will be delivered on November 6th.

Dr. Henry H. Goddard, former director of the State Bureau of Juvenile Research at Columbus, Ohio, has been called to a professorship in abnormal psychology at Ohio State University.

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The Nature of Space—II. THEODORE DE LAGUNA.
Fiske Re-Anticipated. WILLIAM ERNEST HOCKING.
Book Reviews. Journals and New Books. Notes and News.

Volume XIX. No. 17. August 17, 1922

Point, Line and Surface, as Sets of Solids. THEODORE DE LAGUNA.
Doing without Distribution in Formal Logic. RAY H. DOTTERER.
Book Reviews. Journals and New Books. Notes and News.

Volume XIX. No. 18. August 31, 1922

Value and Worth. MAURICE PICARD.
Mind in the Mechanical Order. HENRY BRADFORD SMITH.
The Ancient Landmarks: A Comment on Spiritualistic Materialism. MARY WHITON CALKINS.
Book Reviews. Journals and New Books. Notes and News.

Volume XIX. No. 19. September 14, 1922

Time, Meaning and Transcendence—I. ARTHUR O. LOVEJOY.
Dr. McTaggart and Causality. JOSHUA C. GREGORY.
Book Reviews. Journals and New Books. Notes and News.

Volume XIX. No. 20. September 28, 1922

Time, Meaning and Transcendence—II. ARTHUR O. LOVEJOY.
The Predicate Term. JOHN J. TOOHEY.
Behaviorism and the Programme of Philosophy. JAMES L. MURSELL.
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Monthly. Founded 1904. Edited by Shepherd I. Franz.

Psychological Monographs—Princeton, N. J.; Psychological Review Company.
Subscription $5.50 per vol. 500 pp. Founded 1895. Ed. by James R. Angell.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.; Psychological Review Company.
Subscription $1.50. 200 pp. Founded 1895. Edited by Madison Bentley.
An annual bibliography of psychological literature.

Journal of Philosophy—New York; Sub-Station 84.
Subscription $4. 728 pages per volume. Founded 1904.
Bi-weekly. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Sub-Station 84, N. Y.; Archives of Psychology.
Subscription $5. 500 pp. ann. Founded 1906. Ed. by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology—Boston;
Subscription $5. Richard G. Badger. Edited by Morton Prince.
Bi-monthly. 432 pages annually. Founded 1906. Abnormal and social.

Psychological Clinic—Philadelphia; Psychological Clinic Press.
Subscription $2.50. 288 pages. Ed. by Lightner Witmer. Founded 1907.
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin—Vineland, N. J.; The Training School.
Subscription $1. 160 pages ann. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review—Washington, D. C.; 3617 10th St., N. W.
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Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by John B. Watson.

Journal of Applied Psychology—Worcester, Mass.; Florence Chandler.
Subscription $4. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Beck.

Journal of Comparative Psychology—Baltimore: Williams and Wilkins Company
Subscription $5. 500 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes. J. P.